

The Who and What of Ancient Greece

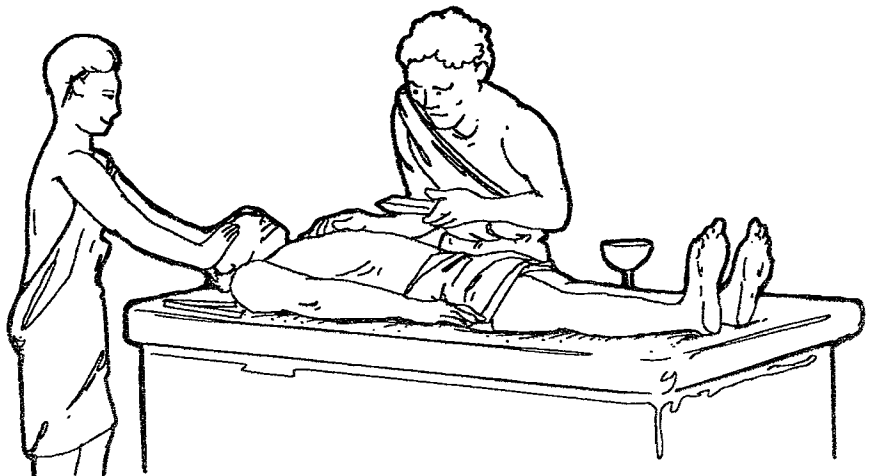
Long before Ancient Greece even existed, most people believed that the gods were responsible for all that happened on Earth. Even most of the Ancient Greek people thought so, but there was a growing number of highly educated individuals who continually searched for answers to their questions by observing their world around them. For the most part, these scholars had little influence over society as a whole. However, their influence and contributions to knowledge and ways of thinking were considerable.

Biology, Botany, and Zoology—Aristotle, the great philosopher and teacher of Alexander the Great, is attributed with founding these areas of scientific study. He was known for his vast collections of plants and animals. He believed that people could learn more about Earth, nature, and themselves through observing, recording, and rational thinking. Another Greek scientist, Xenophanes, understood that fossils were the remains of plant and animal life preserved in rock.

Medicine and Physiology—For centuries any illness or disease was thought to be punishment by the gods, so people went to priests for help in curing disease. Patients often made clay terracotta or bronze models of their diseased body parts to offer them to the gods. Models of legs, eyes, ears, breasts, and noses have been found at shrines. In particular they made offerings to the god of medicine, Asclepius, and traveled to his most famous temple at Epidaurus. According to legend, Asclepius was the son of Apollo. He was raised by a centaur who taught him the art of healing. He was usually depicted holding a large stick with a snake curled around it, the symbol of medicine later given to Hermes by Apollo to carry as his wand in flight. At the temple in Epidaurus large numbers of sick people came to be looked after by the priests of Asclepius, who treated them with magic spells while they slept and prescribed special diets, exercises, and baths.

By the 5th century B.C., schools of medicine were established. Their emphasis was on discovering how the physical body functioned and how to cure disease. Hippocrates was one doctor who practiced a more scientific approach to medicine. He would begin each treatment by finding out as much as possible about the patient: their age, type of work, behavior, and sleep patterns. Then he would ask about the symptoms the patient was experiencing. Over the years he developed a system of diagnosing and the methods of treatment a doctor should follow with different illnesses. He also wrote a pledge about the duty of doctors, called the Hippocratic Oath. Medical doctors still take a version of this oath today. Another doctor named Herophilus began dissecting bodies to learn about the nervous system.

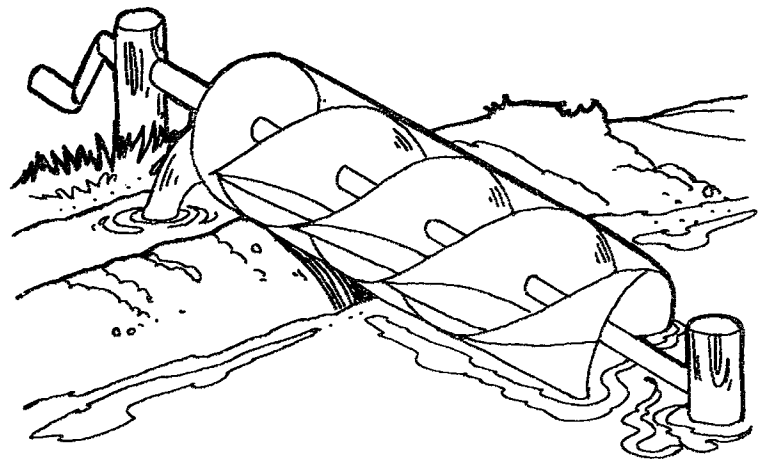
Many doctors in Ancient Greece followed the practice of taking blood from a patient. They believed this would take the disease out of the body. They operated on the body with surgical instruments such as forceps, knives, and probes made of bronze and iron. Powerful herbs, such as opium and the root of the mandrake were used as anesthetics. But these were not very effective and made having an operation a very painful and dangerous experience.



The Who and What of Ancient Greece *(cont.)*

Mathematics—Mathematical calculations were mainly used for measuring distances, surfaces, and curves on and beyond Earth. They were also used in building or construction. Most early Greek mathematics were some form of geometry. Pythagoras was a mathematician who experimented with numbers by using pebbles until he finally worked out his famous theorem on the relative lengths of the sides of a right triangle. He also discovered that the notes of a musical scale in music are mathematically related to the length of the string plucked or the pipe blown into.

Physics and Engineering—The Greeks' skill in engineering and physics is best demonstrated by their beautiful temples. The columns that formed the tall colonnades around buildings were massive stone cylinders held together by metal pegs. The heavy stones were lifted into place using a system of ropes and pulleys. Other simple machines, such as inclined planes and levers, were also used. The screw was used by the inventor Archimedes as a device to raise water from one level to another. A handle was turned, trapping water along grooves and moving it up along the edge of the screw. Pumps like this are still used in Africa today. Archimedes is also attributed with the discovery of the displacement theory. He noticed the water level rise and fall when he got in and out of his bath. He realized that his body displaced its own volume of water. He went on to further experiment with the theory to form new ways to measure volume using displacement.



Astronomy and Geography—Many advances in astronomy were made by the Greeks. Most of them were disbelieved and condemned by society and then proven true by future scientists. The astronomer Aristarchus discovered that the Earth moved around the sun, a theory that was scorned for thousands of years. Anaxagoras believed that the moon did not shine itself, but rather reflected light from the sun. Hipparchus located and charted over 850 stars and noted changes caused by Earth rotating on its axis. Hipparchus also contributed to a more scientific approach to map-making and geography. Now a map-maker could locate a point on the earth by relating it to the positions of stars and other celestial bodies. Calculations were made based on astronomy and land features using the meridian and lines of latitude. Eratosthenes calculated the circumference of the Earth by measuring the angle of the sun at Alexandria in northern Egypt and measuring the distance from there to Syene in the south when the sun was overhead at noon. His figure for the circumference was off by only 320 km. The study of the surface of the Earth became known as geography.

Who Did What?

The object of this game is to correctly identify 12 Greek contributors to science, art, and mathematics. Use the following rules while playing:

1. Decide as a class whether you will play as individuals, partners, or teams.
2. You may use any information from this unit, your social studies book, a dictionary, or encyclopedia to help you find answers.
3. You may only turn in your answers once. Make sure you have checked all information carefully and did not just guess based on the first letter of the name given.
4. The first one to record and turn in 12 correct answers is the winner.

Sappho
Hipparchus
Strabon

Thales
Archimedes
Empedocles

Sophocles
Eratosthenes
Euclid

Ptolemy
Hippocrates
Pythagoras

Read the information in the following boxes that describe some famous Greeks. Research the identities and write the person's name on the line. The first letter of each name has been provided for you.

1. A _____

He lived about 287–212 B.C. He was an astronomer, inventor, and mathematician. He studied at the museum in Alexandria and spent the latter part of his life in Syracuse. He discovered an important law of physics called the Theory of Displacement, which proves that an object displaces its own volume of water. He invented a type of pulley and a screwlike device for raising water.

2. E _____

He was the first known physicist. He attempted to explain the principles of motion. He described how all things come from a combination of four elements: earth, fire, air, and water—a much different view from that held by earlier thinkers.

3. E _____

He lived from about 275–195 B.C. He made many contributions to the study of geography. He attempted to calculate the circumference of the earth using the angle of the sun. His calculations proved to be reasonably accurate.

Who Did What? (cont.)

4. E _____

He moved to Alexandria to establish a mathematics school. He created a system for the study of geometry and wrote 13 books called the “elements.” He is known as “the father of geometry.”

5. H _____

He was born about 190 B.C. in Nicea and is known as the greatest astronomer of ancient times. He built an observatory in Rhodes and cataloged over 850 stars. He compiled and examined all of the records of astronomers before him. He noted changes on Earth such as how it rotates on its axis and how this affects the seasons. He was the first person to record the positions of the stars by lines of latitude and longitude. He also made more accurate measurements of the distances of the sun and moon from the Earth than anyone before him.

6. H _____

He lived from about 460–377 B.C. He was a doctor and wrote about medicine. He founded a famous mathematics school 50 years after the death of Pythagoras that lasted over 200 years. He wrote the first known book on geometry, which made it easier for students to study the subject. He founded the most famous medical school on the island of Cos. He separated medicine from philosophy, religion, and magic. He believed in making observations, recording data, and basing remedies on what was known about the body. His oath regarding the responsibility of a doctor is still taken today by physicians.

7. P _____

He lived from about A.D. 100–170 and became one of the most famous astronomers ever. He wrote a book called “Geography,” which applies his knowledge of astronomy to geography. He located cities and other places of interest by using latitude and longitude. He was one of the first to represent the curved surface of the Earth on a flat plane and show a primitive outline of the Earth. He gathered important data from previous astronomers and published it in a 13-volume book called “A Mathematical Composition.”

8. P _____

He lived from about 560–500 B.C. and is the most famous Greek linked to geometry. He established a mathematics school and developed the theorem for calculating the sides of a right triangle.

Who Did What? (cont.)

9. S _____

She was born around 612 B.C. on the island of Lesbos and later moved to Sicily. She became one of the greatest Greek poets and founded a school for girls. She wrote nine books of poetry and finally died in the middle of the 6th century B.C.

10. S _____

He lived from 496–405 B.C. and was an Athenian writer of 123 tragic plays. He won many prizes at the Festivals to Dionysus in Athens. He was one of the first to write plays that contained more than two characters and used stage scenery. He wrote "Antigone," "Oedipus," "Tyrannus," and "Electra."

11. S _____

He was born around 64 B.C. and wrote "Geography," in which he tried to include everything known about geography up to that time. He was one of the first anthropologists. He had a special interest in the way that people lived and would examine a particular region to describe their lifestyle—their values and beliefs, what they ate, their clothes, and their homes. He recorded a great deal of information concerning the location of mountains, rivers, valleys, and cities as well as earthquakes and volcanoes.

12. T _____

He was born around 624 B.C. He was the first Greek scientist, mathematician, and philosopher to study natural forces and to form ideas about how nature works. He traveled widely to Egypt and the Near East. He formed geometric principles from studying the stars and the Earth and used these principles to calculate the heights of building and distances. He developed a theory that the Earth was flat and floated on water. He incorrectly concluded that earthquakes resulted from waves in the water. This made him one of the first thinkers to search for scientific explanations for events rather than relying on religion and the gods for meaning.

Answers—Fold under or cover before reproducing for students.

1. Archimedes
2. Empedocles
3. Eratosthenes
4. Euclid

5. Hipparchus
6. Hippocrates
7. Ptolemy
8. Pythagoras

9. Sappho
10. Sophocles
11. Strabon
12. Thales